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TITLE SYSTEM AND METHOD FOR
 MESSAGING AND COLLABORATING IN
 AN INTRANET ENVIRONMENT

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SYSTEM AND METHOD FOR MESSAGING AND COLLABORATING IN AN INTRANET ENVIRONMENT

Background of the Invention

Technical Field of the Invention

5 [01] This invention relates to messaging and
collaboration in a corporate Intranet environment using an
HTTP proxy server.

Background Art

10 [02] Advances and developments in packet networks,
consumer premises equipment, network servers, and client
software provide a synergistic environment for the
development of new communication modes and complexities.
Networks such as private intranets and the Internet have
become features of private and public telecommunications
15 infrastructures. E-mail is now a standard form of
communication and information exchange, and instant
messaging has become prevalent as a private extension to
chat groups. Instant messaging services enable online or
network connected parties to generate and deliver text

messages to one another over the network. Some such services allow users to select other persons as collaborators and assign these collaborators to groups, automatically register a person when on-line, advertise the user's selected collaborators to the user when those collaborators register on-line, advertise the user's presence on-line to others who have selected the user as a collaborator, and participate in instant messaging communications between two on-line users.

10 [03] One messaging solution utilizes instant messaging services and communication protocols to locate a registered user, query the user for a proposed message disposition or other action, and coordinate services among a plurality of communication devices, modes, and channels. A user proxy is
15 registered to the user with an instant messaging system as a personal communication services platform. The user creates collaboration groups and defines specific attributes to associates within each group. Included within each associate definition is a user-selected priority assignment.
20 If an associate is assigned a low priority by the user, the associate will never discern whether the user is online or offline, instead the associate will always communicate and interact with the user via the user proxy. If, however, the

associate is assigned a high priority by the user, the
associate will discern the users online status any time he
is registered on line. Associates assigned a highest
priority by the user are able to interface with the user
5 directly when the user is online, and interface with the
user proxy when the user is offline.

[04] Thus, in today's corporate environment there is a
well known and addressed business need for messaging and
collaboration software, such as Lotus Sametime, Microsoft
10 Netmeeting, and the like. These solutions share the
following characteristics. First, the user is required to
explicitly start the client messaging application. Second,
the user can explicitly terminate the messaging application
instead of switching to "Do Not Disturb" mode. Third, the
15 client messaging application requires a separate login
procedure.

Summary of the Invention

[05] In accordance with an aspect of the invention, there is provided a method for operating a server for managing message communications in a network system by first
5 receiving from a first user a request to enter chat mode with a second user; second receiving asynchronously from the second user a request to download any content from said server or any other server; and responding to the request from the second user with the content modified to
10 instantiate a chat session between the first and second users.

[06] In accordance with a further aspect of the invention, a messaging system includes first and second user browsers, a common server, and a network interconnecting
15 them. A message engine at the common server receives from the first user browser a request to enter chat mode with the second user browser; then receives asynchronously from the second user browser a request to download any content from the common server or any other server; and then responds to
20 the request with content modified to instantiate a chat session between the first and second user browsers.

[07] In accordance with an aspect of the invention,
there is provided a computer program product configured to
be operable to manage message communications in a network
system by first receiving from a first user a request to
5 enter chat mode with a second user; second receiving
asynchronously from the second user a request to download
any content from that or any other server; and responding to
the request from the second user with the content modified
to instantiate a chat session between the first and second
10 users.

[08] In accordance with an additional aspect of the
invention, there is provided a program storage device for
storing computer executable code for managing message
communications in a network system by first receiving from a
15 first user a request to enter chat mode with a second user;
second receiving asynchronously from the second user a
request to download any content from that or any other
server; and responding to the request from the second user
with the content modified to instantiate a chat session
20 between the first and second users.

[09] Other features and advantages of this invention
will become apparent from the following detailed description

of the presently preferred embodiment of the invention,
taken in conjunction with the accompanying drawings.

Brief Description of the Drawings

5 [10] Figure 1 is system diagram illustrating the
architecture of a chat environment.

 [11] Figure 2 is a schematic representation of the
sequence of HTTP requests and responses during chat
initiation in accordance with the preferred embodiment of
10 the invention.

 [12] Figure 3 illustrates schematically a chat
invitation form.

 [13] Figure 4 illustrates schematically a chat user
interface.

15 [14] Figure 5 is a high level system diagram
illustrating a program storage device readable by a machine,
tangibly embodying a program of instructions executable by a
machine to perform method steps for dynamically assigning

I/O priority.

Best Mode for Carrying Out the Invention

[15] In accordance with the preferred embodiment of the invention, a multimedia broadcast, unicast and real-time
5 messaging functionality is provided for users of a corporate network which does not use any client software other than an HTTP browser, does not require a separate sign on, and may be configured by the network administrator to prevent users from disabling the messaging functionality delivered via the
10 browser.

[16] Referring to Figure 1, a system diagram illustrates the architecture of the preferred embodiment of the invention. Host 10 includes HTTP proxy server 12 and message engine 14. Communication link 31 connects host 10
15 to a POP3/IMAP server 16, and link 33 to admin server 18. Links 45 connect host 10 to users/groups storage 20, link 35/37 to user A browser 22, link 41 to user B browser 24, and link 43 to user C browser 26.

[17] Message engine (ME) is put at HTTP proxy server 12

since proxy servers can be and usually are enforced for all
browsers 22-26 in a corporate environment. Message engine
14 may be implemented as a software module which looks and
acts as an HTTP proxy server from the browsers' point of
5 view.

[18] To enable unicast messaging capabilities, a user
22 must authenticate with the message engine 14. This may
be done in a number of ways: (1) the user may be required
to authenticate with the HTTP proxy server as part of an
10 organization's network security procedure; or (2) if an SSO
engine is implemented, its user authentication mechanism can
be used; or (3) the user authentication may be substituted
with the client machine authentication, which is a trivial
task for static IP addresses; or (4) a dynamic host
15 configuration protocol (DHCP) server assigning IP addresses
to client machines can keep track of hardware address of
network cards (MAC addresses); or (5) if none of (1)-(4) is
implemented, a user can be explicitly asked to authenticate
with the ME 14 on the first attempt to use it.

20 [19] Content which is sent to a user, say 22, is,
generally speaking, a user interface to a collaboration tool
with the ability to convey text and/or multimedia messages

(including audio-video-stream) in one or both directions.
Thus, the content can include HTML, Java applets,
Javascript, and so forth.

[20] As will be more fully described hereafter, a
5 content page 37 sent to a user A will be returned to browser
22 as a response to a next HTTP request 35 from a browser,
whatever the actual HTTP request 35 was. Message 37 can
either replace altogether the content of an original
response to request 35, or modify it by causing browser 22
10 to open a separate window with the message text.

[21] To further improve the timely delivery of message
37, proxy server 12 may set a short time to live to all, or
most popular, pages served. This is done by setting the
time in the header of HTML pages in cache.

15 [22] In accordance with the present invention, the
following functionality may be implemented.

[23] First, message broadcast for all or a group of
users in a corporate Intranet. This functionality is
primarily intended for the delivery of urgent public
20 announcement messages 31, 33, ranging from weather, fire or

civil defense alerts to corporate-level announcements. User groups 20 can be organized according either to the organizational chart (departments, divisions, etc.) or to actual user location (building, floor, etc.) For broadcast
5 functionality, user authentication with the message engine 14 is not required.

[24] Second, message unicast for a particular user. This functionality is primarily intended for delivery of urgent messages 31, 33, such as urgent e-mails, short
10 messages, reminders, etc.

[25] Third, chat mode. When user C wishes to open a chat session with user A, he sends a request 43 to message engine 14 used by both browsers 22, 26. ME 14 signals the HTTP proxy server 12, which then incorporates a chat user
15 interface into the next HTTP response 37 served in response to an HTTP request 35 to user A's browser 22. Chat functionality is implemented in executable client-side code and in the ME 14 server side module.

[26] Referring to Figure 2, a schematic representation of the sequence of HTTP requests and responses during chat
20 initiation is presented.

[27] Prior to step 43, user C points browser 26 to a known chat URL residing on a local Intranet server 10, and downloads an executable piece of content (a Java applet). Upon downloading and executing the code, browser 26 displays a chat invitation form 50 (Figure 3), which in this exemplary embodiment includes header field or panel 51, instruction field 52, one or more fields 53-55 for entering the user IDs of users 22, 24 to chat with, and a message field 56. A TCP connection 43, 44 is established with message engine 14. User C enters the userID of, say, user A, enters a message in data field 56, and in step 43 submits the request.

[28] Table 1 illustrates a sample format for chat message 43.

15

TABLE 1 SAMPLE CHAT MESSAGE FORMAT

CHAT-START userC@mail.some-corp.com
INVITE userID=userA@mail.some-corp.com
CHAT-MSG Hi%2CBob,%2Cchow%2Csales%2Care%2Cdoing
CHAT-END

20

[29] Some time after User C submitted chat invitation 43 (form 50) to message engine 14, user A asynchronously submits some HTTP request 35 to download any document or

other content from the corporate Intranet or the Internet.
At this stage, user A does not know about user C's intention
to initiate the chat, but rather is performing some normal
activity.

5 [30] Table 2 illustrates a sample HTTP request 35.

TABLE 2 SAMPLE HTTP REQUEST SUBMITTED BY USER A

10 GET /index.html HTTP/1.1
 Accept: text/plain,text/html,*/*;q=0.3
 Host: www.cnn.com
 User-Agent: Mozilla
 Connection: Keep-Alive

15 [31] When HTTP proxy server 12 detects the HTTP request
 35 from user A (with which user C desires to chat), it
 accesses the URL requested by user A and serves it as
 response message 37 to browser 22, modifying it as
 illustrated by the bold highlighted material in Table 3, at
 lines 42-44. The modification is added immediately after
 the <body> flag, and cause another browser window 60 (Figure
 4) to open at browser 22, including a header field 61, a
20 messages field 62, and a response field 63. The contents of
 this browser 22 window cause a chat applet instance to

download from host 10 and execute at browser 22. This
applet establishes a TCP connection with server 12, thus
establishing a channel 35, 37, 43, 44 for message exchange
between two chat clients 22, 26, with chat server 12 acting
5 as proxy.

TABLE 3 MODIFIED HTTP RESPONSE FROM PROXY SERVER TO USER B

```
1 Last-modified: Mon, 28 Jul 2003 18:59:47 GMT
2 Expires: Mon, 28 Jul 2003 19:00:47 GMT
3 Cache-control: private, max-age=60
4 Content-type: text/html
5 Transfer-Encoding: chunked

6 <!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 4.01
7 Transitional//EN">
8 <html lang="en">
9 <head>
10     <meta http-equiv="content-type" content="text/html;
11 charset=iso-8859-1">
12     <meta http-equiv="refresh" content="1800">
13     <title>CNN.com</title>
14     <link rel="Start" href="/">
15     <link rel="Search" href="/search/">
16     <link rel="stylesheet"
17 href="http://i.cnn.net/cnn/.element/ssi/css/1.0/main.css"
18 type="text/css">
19     <script language="JavaScript1.2"
20 src="http://i.cnn.net/cnn/.element/ssi/js/1.0/main.js"
21 type="text/javascript"></script>
22     <script language="JavaScript1.1"
23 src="http://ar.atwola.com/file/adsWrapper.js"></script>
24     <style type="text/css">
25     <!--
26 .aoltextad text-align: justify; font-size: 12px; color:
27 black; font-family: Georgia, sans-serif
28 -->
29 </style>
30     <script language="JavaScript1.1" type="text/javascript"
31 src="http://ar.atwola.com/file/adsPopup2.js"></script>
32     <script language="JavaScript">
33 document.adoffset = 0;
34 document.adPopupDomain = 'www.cnn.com';
35 document.adPopupFile = '/cnn_adspaces/adsPopup2.html';
36 document.adPopupInterval = 'P24';
37 document.adPopunderInterval = 'P24';
38 adSetOther('&TVAR='+escape('class=us.low')));
39 </script>
```

```

40 </head>
41 <body class="cnnMainPage">

42 <script language=javascript>
43   window.open('http://proxy-chat.some-corp.com/index.jsp');
44 </script>

45 <a name="top_of_page"></a>
46 <a href="#ContentArea"></a>
50 <table width="770" border="0" cellpadding="0"
51   cellspacing="0" style="speak: none">

```

[32] User A's response 44 to user C will be delivered by chat proxy server 12 to user C's chat client over the TCP connection 43, 44 client browser 26 has previously established with chat server 12 based on the CHAT-RESPOND field value of the chat response message example of Table 4, at line 2.

TABLE 4 CHAT RESPONSE MESSAGE EXAMPLE

```

10 CHAT-START userA@mail.some-corp.com
   CHAT-RESPOND userC@mail.come-corp.com
   CHAT-MSG Not%2Cvery%2Chow%2Clately...
   CHAT-END

```

Alternative Embodiments

[33] It will be appreciated that, although specific embodiments of the invention have been described herein for purposes of illustration, various modifications may be made without departing from the spirit and scope of the invention. Referring to Figure 5, in particular, it is within the scope of the invention to provide a computer program product or program element, or a program storage or memory device 100 such as a solid or fluid transmission medium 110, magnetic or optical wire, tape or disc 106, 108, or the like, for storing signals readable by a machine as is illustrated by line 104, for controlling the operation of a computer 102, such as a host system 10 or storage controller 31, according to the method of the invention and/or to structure its components in accordance with the system of the invention.

[34] Further, each step of the method may be executed on any general purpose computer, such as IBM Systems designated as zSeries, iSeries, xSeries, and pSeries, or the like and pursuant to one or more, or a part of one or more, program elements, modules or objects generated from any programming language, such as C++, Java, Pl/1, Fortran or

the like. And still further, each said step, or a file or object or the like implementing each said step, may be executed by special purpose hardware or a circuit module designed for that purpose.

5 [35] Accordingly, the scope of protection of this invention is limited only by the following claims and their equivalents.